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FOOD TECHNOLOGY

ABSTRACTS

CENTRAL FOOD TECHNOLOGICAL
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No.37

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CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

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* Indian Author
** CFTRI Author
\+ Indian Journal

1. GENERAL

1.1 Food protection during distribution, P.SCHENCK, J.Milk & Fd Technol., 1973, 36 (8), 429.

General.

1.2 Food Standards and controls in Canada, W.KEMPA, J.Milk & Fd Technol., 1973, 36 (7), 398.

Brief review of organisation and administration of food controls in Canada.

JVS

2. CEREALS

**+2:31 A simple inexpensive device for detecting and estimating cracks in intact paddy grains, T.SRINIVAS and H.S.R.DESIKACHAR, J.Fd Sci. Technol., 1973, 10 (4), 197.

Based on the principle of partial illumination through narrow slit transmitting light from below, a unit has been developed to detect and count the cracks in intact paddy grains. A counter unit for holding 100 grains and examining them for cracks has been prepared and found suitable in routine processing work.

AA

2.32 The effect of ionizing radiations on some physical and chemical properties of Pakistani rice. II. The effect on starch and starch fractions, M.A.CHAUDHRY and G.GLEW, J.Fd Technol., 1973, 8 (3), 295.

With the increase in irradiation dose, the absolute density of the starch granules and gelatinization temperature of the starch were decreased. The iodine binding capacity, the β-amylolysis limit and the average chain length of the starch amyloses were decreased by radiation treatment. The iodine capacity and the beta-amylolysis limit of the starch amylopectins were increased as a result of radiation treatment.

AA

**+2.33 Observations on the sorption of water vapour by rice and sorghum, J.R.RANGASWAMY, J.Fd Sci. Technol., 1973, 10 (2), 59.

The rate of sorption of water vapour by rice grain and sorghum at different relative humidities and their equilibrium moisture content are determined.

AA

*+2.34 Biochemical characteristics of different varieties of Punjab wheat (Triticum aestivum), G.S.BEDI, S.S. SANDHU and N.NATH, J.Fd Sci. Technol., 1973, 10 (4),164.

The varieties investigated are C-281, C-206, S-307, S-331, Lermarajo, S-308 and K-227. The parameters investigated included protein, starch, crude fibre, total lipids and phospholipids. Protein content was similar in all the varieties except C-306 (12.8%). Indigenous varieties had lower proportion of amylose than those of various Mexican hybrids. The number of glucose residues per non-reducing end group of amylopectin was higher in starch from C306, whereas this number was lower and similar in other six varieties. Choline containing phospholipids form a good proportion of the total phospholipids in all samples and phosphatidyl ethanolamine was also present in good amounts in all samples except C306.

KAR

2.35 Characterisation of three wheat proteins found in chloroform - methanol extracts of flour, D.G.REDMAN and J.A.D.EWART, J.Fd Technol., 1973, 24 (5), 629.

Three wheat proteins (CMI,CM2 and CM3) constituting more than 1% of flour proteins have been isolated from chloroform-methanol (2:1 v/v) extracts of flour.CM1 and 2 have single chains with m.w. of 13,000 and isoleucine as the C-terminal amino acid. They are moderately soluble in water. CM3 becomes insoluble after reduction of SS bonds due to aggregation of the reduced polypeptide chains by secondary forces. The mobilities of CM2 and 3 at pH 3.2 are very close to ALB 13A and ALB 13B respectively, and the albumins found in the electro phoretic patterns of crude gliadin preparations do infact represent mixtures of both classes.

AA

2.36 Resistography: a dynamic quick method to classify wheat and flour quality, H.BRABENDER, Cereal Sci. To-day, 1973, 18 (7), 206.

The description, function and adaptations of resistograph, a high shear dough recording equipment have been given.

JVS

2.37 Wheat mix make-up proceedures, F.F.NIERENBERGER and A.B.WARD, Cereal Sci. To-day, 1973, 18 (8), 225.

The possible use of mathematical modes for blending wheat flours to make pan-bread has been described. The factors that discourage the use of such models have also been indicated.

JVS

2.38 The relation between flour mineral content and flour color reflectance values, W.C.SHUEY and S.K.SKARSAUNE, Cereal Sci. To-day, 1973, 18 (8), 229.

A method is described using an M-500-A Agtron (reflectance spectrophotometer) to study the color change with extraction. Inverse relations and highly significant correlation coefficients were found between ash content and Agtron readings. A0.963** correlation coefficient between predicted and observed ash values were found when the regression equation obtained from the slurry method (Campbell Taggert) was used.

AA

*+2.39 Enzymic browning of whole wheat meal flour: Cysteine inhibition of tyrosinase, RANDHIR SINGH and T.R. AHLAWAT, J.Fd Sci. Technol., 1973, 10 (4), 172.

The presence of cysteine with tyrosine resulted in an induction period before the oxidation of tyrosine began. The rate of oxidation was decreased with successive increase in the concentrations of cysteine. Oxidation of DOPA was inhibited at higher concentrations of cysteine, but it did not inhibit the oxidation of chlorogenic acid. Oxygen uptake with chlorogenic acid plus cysteine was higher than in the absence of cysteine. Tyrosine oxidation was not inhibited in the presence of chlorogenic acid. The initial site of cysteine inhibition of enzymatic browning caused by tyrosine oxidation appears to occur at the oxidation of tyrosine to DOPA.

KAR

*+2.40 Studies on soybean enriched bread, KIRAN SURANA, DIPALI ROY and S.P.NETKE, J.Fd Sci. Technol., 1973, 10 (2), 61.

Fortified breads were prepared using 5,10,15 and 20 per cent semifatted soyflour (SSF). Incorporation of soyflour improved the quality scores at all levels, but loaf volume decreased considerably. Increasing the water content from 60 to 70 per cent and the yeast content from2 to 3 per cent improved the loaf volume in breads fortified with 10 percent SSF or 10 percent defatted soyflour (DSF). The addition of "Emplex" always gave the best breads.

AA

2.41 Nutritive value and baking properties of bread supplemented with Candida utilis, E.YANEZ, H.WULF, DIGNA BALLESTER, NATIVIDAD FERNANDEZ, VIVIEN GATTAS and F.MONEKEBERG, J.Sci.Fd Agric., 1973, 24 (5), 519.

Addition of C.utilis adversely affected the farinograph volarimeter value, and the physical dough characteristics. The loaf volume decreased and the colour became increasingly darker, however addition of C.utilis increased the concentration of crude protein from 14.4% to 21.3% at 10% enriched bread; p.e.r. progressively increased from 0.84 for the control to 1.74 for 10% supplementation.

KAR

*+2.42 Protein enriched milk biscuits, R.K.BASSI and SUKUMAR De, J.Fd Sci. Technol., 1973, 10(4), 131.

Addition of sodium caseinate and wheat - maida in the ratio of 1:2 and a ratio of 1.2:1 of cooking butter: wheat maida gave best results. The time temperature combination of baking caseinate biscuits was found to be 190 ± 5°C for 25-30 min. Addition of 10-20 per cent skim milk powder improved the colour and appearance; the moisture content of the biscuit was 2.55 per cent.

KAR

*+2.43 Studies on the browning of heat processed Chapaties and allied products in relation to their chemical constituents, S.B.KAUNUR, M.N.RAMANUJA and D.B.PARIHAR, J.Fd Sci. Technol., 1973, 10(2), 64.

The degree of browning during heat sterilization in Chapaties and other foods (parottas, puries) could be measured spectroscopically at 375 mμ which Chapaties were processed at 15 and 20 psi for 10 to 40 min, the rate of increase in browning was much higher than that processed at 10 psi. The level of both reducing and non-reducing sugars along with free amino nitrogen decreased as browning increased.

KAR

*+2.44 Detection of corn products in flours of Pea, Bengalgram and wheat products by the use of free proline content of corn, C.P.HARTMAN, SAROJA PICHAMUTHU, N.G. DIVAKAR and U.N.NAGARAJA RAO, J.Fd Sci. Technol., 1973, 10 (3), 129.

The proline content of corn, pea, Bengal gram and wheat flours was 15.78, 1.14, 1.96 and 1.29 (mg/100g) and hence the proline content can be used as a basis for the detection of corn flour in other flours.

KAR

*+2.45 Beta-amylase activity in germinated bajra and barley varieties, V.S.SHELORIN and D.S.WAGLE, J.Fd Sci.Technol., 1973, 10 (4), 184

Starch content among bajra varieties (HB-1, HB-3 and HB-4) ranged from 56.42 to 61.91% while the range was 67.13 to 68.09% in barley varieties (BG-1, C-138 and C-164). Beta-amylase activity increased progressively with germination upto 30 hr and then decreased upto 72 hr in case of bajra varieties, while it continuously increased upto 72 hr in case of barley varieties.

KAR

2.46 A review of proteins in barley, Oats and buckwheat, Y.POMERANZ, Cereal Sci. To-day, 1973, 18 (9), 310.

Review of work of 4 years by Barley and Malt laboratory, Wisconsin dealing with protein and amino acid composition of cultivars and selections, distribution of amino acids in the kernel, and changes occuring during the processing of these food cereals. 22 references.

JVS

See also

Aflatoxin in Corn, 15.19, 15.20, 15.21.
Analysis of Ochratoxin A and B and their esters in barley, 15.26, 15.27.
Diuron in wheat, determination, 16.12.

3. PULSES

*+3.3 Qualitative studies on identification of pulses, C.P.HARTMAN, N.G.DIVAKAR and U.N.NAGARAJA RAO, J.Fd Sci. Technol., 1973, 10 (4), 195.

Individual pulses examined contained at least one characteristic phenolic compound which is not found in other pulses and this could be used as a criterion for distinguishing different pulses.

KAR

See also

Detection of corn products in Pea and Bengalgram, 2.44.

4. FRUITS, VEGETABLES AND TUBERS

4.33 Preparative argentation column chromatography for separation of sterols from orange vesicles, H.E. NORDBY and S.NAGY, J.Chromatog. 1973, 79 (1), 147.

Gradient elution, argentation chromatography (AC) was found useful for separating desmethyl sterols present in valencia orange juice sac lipids. The sterols as acetates from fractions off AC columns can be further resolved and analysed by conventional TLC and GC. In addition to seven sterols previously reported in citrus ten additional sterols comprising. 3.2% of toral sterols have been isolated from citrus for the first time. These have been characterised as 3 saturated, 3 mono-unsaturated and 4 diunsaturated desmethyl sterols.

AA

4.34 The role of sulphur dioxide and nitrate on detinning of canned grape fruit juice, I.SAGUY, C.H.MANNHEIM and N.PASSY, J.Fd Technol., 1973, 8 (2) 147.

SO_2 even at 1 ppm level showed highly significant effect on corrosion when dissolved tin and iron* were taken as the corrosion criteria. Two equations rate of corrosion over time. The threshold value of nitrate for tin dissolution in cans with a 3 mm headspace was 6 ppm while with a 30 mm head space it was 2 ppm. For iron dissolution the threshold was 6 ppm at both head space levels. A linear relationship between dissolved tin and iron in the presence of nitrates was found.

*were drawn using statistical analysis describing

KAR

4.35 The degradation of anthocyanins in canned strawberries .I. The effect of various processing parameters on the retention of pelargonidin-3-glucoside, J.B.ADAMS and M.H.ONGLEY, J.Fd Technol., 1973, 8 (2), 139.

Normal commercial exhaust and sterilization procedures have little effect on the degradation of pelargonidin-3-glucose, high storage temperature increases the rate of breakdown of anthocyanins; good retention was obtained by storing at 0-S.C. Omitting the heat process did not increase the stability of pelargonidin-3-glucoside during the storage of canned strawberries.

AA

*were drawn using statistical analysis describing the

4.36 The degradation of anthocyanins in canned strawberries, Part II. The effect of various additives on the retention of pelargonidin-3-glucoside, J.B.ADAMS and M.H. ONGLEY, J.Fd Technol., 1973, 8 (3),305.

Of the various additives tested, it was found that 2-thiobarbituric acid, or high levels of sucrose led to low retention of pelargonidin-3-glucoside while cystine or sodiumsulphite, or lowering the pH in the absence of added sucrose increased pigment stability.

KAR

4.37 Texture changes in canned apricots. II. Study of infection with Rhizopus stolonifer under commercial conditions, K.A.HARPER, B.B.BEATTIE and D.J.BEST, J.Sci. Fd Agric., 1973, 24 (5), 527.

The softening or 'texture breakdown' found in canned apricots caused by R.stolonifer was not prevented by the heat treatment normally given in canning; the breakdown was also observed in samples where artificial inoculation was not done.

KAR

4.38 An improved method for debittering apricot kernels, R.SCHAB and S.YANNAI, J.Fd Sci. Technol., 1973, 10, (2), 57.

In the improved method, the peeled and coarsely ground kernels are soaked for 2 hr in slightly acid water (pH 6.5) at 55C with nearly complete breakdown of the bitter principle, and the hydrolytic products - hydrocyanic acid and benzaldehyde are removed by steam distillation. Marzipan made with these debittered kernels was found to be as good organoleptically as that made with sweet almonds.

AA

*+4.39 Utilisation of musk melon (Cucumis melo L) variety Hara Madhu, URMIL BINDRA, S.P.MANJREKAR and S.C.JAIN, J.Fd Sci. Technol., 1973, 10 (4), 176.

Hara Madhu variety of musk melon could be successfully utilized for the preparation of canned slices and cubes in syrup; the product could stand for 2 months. The jam prepared had good consumer acceptance with good colour, flavour and consistency.

KAR

*+4.40 Changes in Amla on fermentation in brine, P.N.KOLI and P.R.KULKARNI, J.Fd Sci. Technol., 1973, 10 (2),74.

Preservation in 8 per cent salt gave an acceptable product.

AA

*+4.41 Chemical composition of tender shoots and leaves of Raya (Brassica juncea) mutants, K.S.LOBANA, J.S.GARCHA, M.L.GUPTA and B.N.SHARMA, J.Fd Sci.Technol., 1973, 10 (3), 125.

Protein content of the mutants ranged from 28.31 to 37.38 per cent of which RLM 240 gave the maximum protein. The mineral matter content of the mutants ranged from 8.48 to 14.20 per cent.

KAR

4.42 The effect of maturity on the texture of the testa and cotyledon of peas (Pisum sativum), H.G.WAGER and F.A.E.PORTER, J.Fd Technol., 1973, 8 (2), 121.

The texture of the separated testa and cotyledon of peas both when raw and cooked were measured with a small penetrometer over a wide range of maturity. The values for the raw test rose little with increase in age but the cooked testa and the raw and cooked cotyledon all rose markedly.

AA

4.43 Lipid of potato tubers. 1. Lipid and fatty acid composition of tubers from different varieties of potato, T.GALLIARD, J.Sci. Fd Agric., 1973, 24 (5), 617.

Tubers from 23 varieties of potato showed similar lipid content and lipid components. The polyunsaturated fatty acids, linoleic and linolenic acids represented 51 to 60 and 13 to 24% respectively of the total fatt-y acids.

KAR

4.43 Lipids of potato tubers. II. Lipid degrading enzymes in different varieties of potato tuber, T.GALLIARD and J.A.MATHEW, J.Fd Technol., 1973, 24 (5), 623.

Of the 23 varieties examined, 22 had very high levels of the hydrolytic enzyme, ranging from 5 to 50 /u mol of substrate hydrolysed/min/g of fresh weight of tuber. All varieties contained high levels of lipoxygenase activity in the range of 1 to 25 /u mol of O_2 consumed/min/g fresh weight of tuber with linoleic acid as substrate.

4.45 The influence of processing upon the nutritive value of the potato. Studies with young chicks, J.P.FELIX D'MELLO, COLIN T WHITTMORE and FRANCIS W.H. SLSLEY J.Sci. Fd Agric., 1973, 24 (5), 533.

Chicks fed con trol diet containing no potato grew at a better rate than those offered 19% dried cooked potato or free-dried raw potato. By the addition of lysine (highest level of 0.16%) the depression in performance caused by the addition of cooked potato was not completely reversed.

KAR

4.46 Control of colour in potato crisps by water treatment before frying, R.S.MITCHELL and P.J.RUTLEDGE, J.Fd Technol., 1973, 8 (2), 133.

Optimum conditions were determined for leaching excess reducing sugars from potato slices before frying. The rate of leaching in water was greatest at 73°C and satisfactory crips were produced from potatoes with upto 0.4% reducing sugars.

AA

*+4.47 Comparative studies on some chemical aspects of white and red globe onions, C.BANDYOPADHYAY, A.S.GHOLAP and G.M.TEWARI, J.Fd Sci. Technol., 1973, 10(4),169.

Except the variation in the amount of volatile components, there was no radical change in the composition of the volatiles between the two varieties. The primary distinction is in the presence of anthocyanin pigment in red variety.

KAR

*+4.48 Pectic substances in onion and garlic skins, M.M. ALEXANDER and G.A.SULEBELE, J.Fd Technol., 1973, 24 (5), 611.

Extraction with ammonium oxalate gave 11 to 12% of pectin from white onion and garlic skins which are the by-product of dehydration industry. Pectins from white onions were superior to red onions in terms of gelly grade. Both types of onion pectins appeared to be of the rapid set type while that of garlic was medium set variety. Pectic substances from onion skin differed from garlic skin in the viscosity behaviour and other characteristics.

KAR

See also

Apple juice, patulin determination, 15.28.
Tonic heavy metals in vegetables, 15.37.
Estimation of carbonyl in fruits and vegetables, 16.6.

5. OILSEEDS AND NUTS

5.6 Varietal and environmental differences in the proteins of the groundnut, Archis hypogaea, R.DAWSON and A.D.McINTOSH, J.Sci. Fd Agric., 1973, 24(5), 597.

The arachin and conarachin fractions were extracted from 3 samples of groundnut. Marked variations in the electrophoretic patterns, especially of the conarachin fractions were observed and the amino acid composition of the fractions showed highly significant differences with respect to variety and environment.

KAR

5.7 Fine structure of soybean seed coat and its changes during cooking, K.SAIO, K.ARAI & T WATANABE, Cereal Sci. Today, 1973, 18 (7), 197.

Description of electron microscopic structure.

5.8 Sensitivity of Guinea pig to raw soyabeans in the diet, J.R.PATTEN, J.C.PATTEN and H.POPE,II, Fd & Cosmet. Toxicol., 1973, 11 (4), 577.

High rate of mortality was found in weanling guinea pigs fed raw soya diet for 30days. The excised pancreas from test animals was larger than controls fed casein diet. Young Guinea pigs showed increases in pancreatic trypsinogen, chymotrypsinogen, and amylases as a result of feeding on soya. Adult Guinea pigs fed soya diet did not show enlarged pancreas or suffered any death as compared to controls. The pancreatic trypsinogen and amylase activities were however, higher than in controls but there was no change in chymotrypsinogen activity.

JVS

5.9 The study of some properties of rapeseed protein with a view to protein concentrate production, A.GIRAULT, J.Sci. Fd Agric., 1973, 24 (5), 509.

Optimum conditions for extraction and precipitation of rapeseed proteins have been defined: 10% NaCl extracts 70% of the total nitrogen of a laboratory defatted flour and 0.1 N - NaOH, 89% (but only 62% of the total nitrogen of an industrial oil meal.) Maximum precipitation occurs at pH 3 (NaCl extract) and pH 6.5 (NaOH extract) with fairly low yields (22 and 51% of protein nitrogen respectively.

KAR

See also

Free fatty acid content of mustard oil, 6.12.
Refining rapeseed oil, 6.14.

6. OILS, FATS AND WAXES

6.8 Clay heat refining of edible oils, T.K.MAG, J.Am.Oil Chem. Soc., 1973, 50 (7), 251 .

In recent years, the free fatty acids content of crude oils (which is only a fraction of 1%) is removed by the process of deodorisation. A prerequisite for this is to remove the substances that interfere with the deodorisation. The process of bleaching with elays has been found useful for this purpose, if the oil is pretreated with 0.1-0.5% phosphoric acid and bleached at 325-350°F. The use of bleaching clay upto 2% level is suitable for many oils.

JVS

6.9 Application of partial hydrogenation theory to the design of commercial reactors for hydrogenating triglyceride oils, L.F.ALBRIGHT, J.Am.Oil Chem.Soc., 1973, 50 (7), 255.

Review. Discusses application of fundamentals of hydrogenation, (rates of hydrogenation, importance of physical transfer and adsorption steps, modelling of partial hydrogenation), batch reactor considerations, continuous flow reactor systems, (Proctor and Gamble process, Lurgi process, Pintsch-Bamag reactor and Buss reactor) and reactor improvements. 4 0 references.

JVS

6.10 Frontal, elution liquid chromatography of a total artefacts peak in frying oils, A.AITZETMULLER, J.Chromatog. 1973, 79 (1), 329.

The production of a total 'artefact peak' from frying oils seems feasible according to the authors. This is reported to become possible by appropriate choice of column equilibriation procedures which permit the least polar major class of artefacts, non polar dimeric triglycerides to move further away from the normal triglycerides and into the polar peak eluted by ethanol front. The authors point out that since all the major artefacts are now combined in 1 peak, this peak should be a still more sensitive indicator of general oil degradation.

JVS

6.11 Water-cycle washing of refined soyabean oils, plant scale evaluation, R.E.BEAL, L.T.BLACK, E.L.GRIFFIN, J.C.MENG and G.S.FARMER, J.Am.Oil Chem. Soc., 1973, 50 (7), 260.

A series of 24 hour tests were carried out with different operating conditions for the recycling of wash water obtained during the ripening of soya bean oil. The best conditions for the removal of sodium were pH 2.5 and oil-water ratio of 2.5:1. The hydrogenation rate of the bleached oil was comparable to that of conventionally washed oil.

JVS

*+6.12 Free fatty acid content of mustard oil, A.R.SEN and P.SENGUPTA (Mrs), J.Fd Sci. Technol., 1973, 10(3), 128.

Analysis carried out with 373 samples indicated that the free fatty acid content of the oil does not generally exceed 2-0 per cent in 9 months and hence the value fixed in PFA appears to be on the higher side.

KAR

6.13 Extraction and methanolysis of oil from whole crushed rapeseed for fatty acid analysis, F.M.LOUGH and V.TODD, J.Am. Oil Chem. Soc. 1973, 11 (4), 230.

Three methods have been described for extraction of oil from rapeseed. The whole seed method consists in soaking whole seeds in petroleum ether and benzene for 2 days at room temperature. The extracted oil has the same fatty acid composition as total seed oil. In the 'crushing method' seeds are slightly crushed before the extraction of the oil. In the

half seed method, the oil extracted from the cotyledon of the seed is used for fatty acid analysis. In all these methods the extracted oil is reacted with sodium in methanol at room temperature to convert it to fatty acid methyl esters.

JVS

6.14 Experiences in refining rapeseed oil by the Zenith process, Y.HOFFMAN, J.Am.Oil Chem. Soc., 1973, 50 (7), 260A.

The Zenith process invented in Sweden during 1960 enables the refinement of rape seed oil to a high degree. The first step consists of the treatment of oil with concentrated phosphoric acid to remove the some of the non fatty substances; the second step is the neutralisation using weak lyes and the third step is bleaching also performed under vacuum. Thereafter, the entire oil is filtered. The oxidation value of the deodorised oil is minimised by delicate handling of the seed and suitable refining procedure to increase the shelf life.

JVS

6.15 A method for analysing alkanals from autoxidising fats, H.HALVERSON, J.Chromatog., 1973, 76(1), 125.

The volatile carbonyls are isolated from fat by steam distillation, by employing a stripping inert gas and then recovered as their 2,4-dinitrophenyl hydrazones on a solid support. Thedetermination of alkanals was accomplished byGC of the adsorbed 2,4 - dinitrophenyl hydrazones. In a test study on autoxidised chicken fat close correlation was found between peroxide value and n-hexenal content.

JVS

6.16 GC characterisation of cooking fats with reference to a case of murder, J.B.F.LOYD & B.H.G.ROBERTS. J.Chromatog., 1973, 77 (1), 228.

A technique based on the pyrolysis of tetramethylammonium hydroxide saponification products of fats was used to obtain chromatograms of methyl esters.

JVS

6.17 Development of edible tallow fractions for speciality fat uses, F.E.LUDDY, J.W.HAMPSON, S.F.HERB and H.L. ROTHBART, J.Am.Oil Chem. Soc., 1973, 11 (4), 240.

Five fractions were obtained from edible beef tallow by an acetone crystallisation proce-dure; 2 of them were solid fractions, two were liquid fractions and one a semi solid fraction. The liquid fraction had a melting profile similar to that of salad oil; the profile of the semi solid fraction resembled that of butter. Mixtures of 5% and 50% cocoa butter with semi solid fraction had melting profiles similar to that of butter.

JVS

6.18 Negative finding of 2,3,7,8 - tetrachlorodibenzo-p-dioxin in cooked fat containing actual and fortified residues of Ronnel and/or 2,4,5-trichlorpphenol, R.R.WATTS & R.W.STORRHERR, J.Ass.Off. anal.Chem., 1973, 56 (4), 1026.

Beef fat samples fortified with 2000 ppm of 2,4,5-trichlorophenol or its sodium salt did not show any tetra - dioxin after cooking at 500 F for 6-22 hours.

JVS

6.19 Factors affecting analytical values of beeswax and detection of adulteration, A.P.TULLOCH, J.Am.Oil Chem. Soc., 1973, 50 (7), 269.

Estervalues of beeswax were determined by using synthetic long chain monoesters. GLC showed that free acids reduced on heating of wax and the unsaturated hydrocarbons and monoesters were also lost. As little as 1% of a paraffin m.p 83°C and 6% of more of paraffin could be traced by saponification c loud point. GLC could detect and determine the carnauba wax at 2.5% level in beeswax.

JVS

See also

Dielectric measurement of fat in fish and fish products, 9.37.
Lipids of potato tubers, 4.43, 4.44.
Separation of sterols from orange viscicles, 4.33.

7. STARCH, SUGAR AND CONFECTIONERY

7.4 Palatability and colorimetric characteristics of sponge cakes prepared with egg yolks of varying color intensities and hues, S.T.McCREADY, J.L.FRY and C.F.HINTON, Cereal Sci. To-day, 1973, 18 (7), 202.

The palatability of canthaxanthin pigmented sponge cakes was not significantly affected by pigment levels. Sponge cakes prepared by using egg yolk from hens fed 11,22 and 44 mg levels of beta-apo-8'-caratenol had improved flavor, greater tenderness as compared those prepared from control eggs and canthaxanthin pigmented eggs.

JVS

*+7.5 The quality of soft-serve ice cream as influenced by the levels of fat, emulsifier, sucrose substitutes and processing conditions, GOYAL G.K. and M.R.SRINIVASAN, J.Fd Sci. Technol., 1973, 10 (3), 122.

Ice-cream made from 7 per cent fat and 12 per cent milk solids not fat was highly acceptable. Use of 0.2 percent glycerol mon-stearate in the mix produced soft ice-cream with highly desirable qualities. Replacement of 35 per cent of added sugar with regular conversion corn syrup produced soft ice cream of best quality followed by dextrose (25 per cent sucrose substitution) The soft ice cream served at -4.4 to -5.3°C with 50-60 per cent over run was most acceptable.

AA

See also

Changes in the carbonyls of burfi, 10.17.
Quality of Channa, 10.13.
Quality of Khoa, 10.13.
Nisin for cheese and khoa, 12.19.

8. SPICES AND CONDIMENTS

**+8.3 Chemical composition of raw and roasted Fenugreek seeds, N.B.SHANKARACHARYA, S.ANANDARAMAN and C.P. NATARAJAN, J.Fd Sci. Technol., 1973, 10 (4), 179.

Twenty four samples of fenugreek seeds were analysed for moisture, total ash, acid insoluble ash, petroleum ether extract, alcohol and hot water extracts, and total nitrogen are given for raw seeds along with the changes taking place on roasting at 150, 175 and 200°C. Light roasted seeds (150°C) are found to be superior to 175 and 200°C roasted seeds with regard to flavour. Fenugreek seeds are rich source of protein.

KAR

*+8.4 Importance of volatile oil and cold water extract estimation in analysis of cumin (Jira), A.R.SEN, P.K.SARDAR, S.SIL and J.V.MATHEW, J.Fd Sci. Technol., 1973, 10 (4), 187.

Determination of volatile oil and water extract is recommended to prevent admixture of exhausted spice in cumin.

AA

*8.5 Suggested modification on PFA specification in case of coriander (dhania), A.R.SEN, P.K.SARDAR, S.SIL and T.V.MATHEW, J.Fd Sci. Technol., 1973, 10 (3), 126.

Suggests that the upper limit for ash insoluble in dil HCl may be fixed at 1.25 per cent and that for volatile oil, 0.2 per cent and cold water extract 8.5 per cent.

KAR

*+8.6 Randhuni (Apium graveolens L) and its quality standards, A.R.SEN, P.K.SARDAR, K.S.BISWAS and T.V.MATHEW, J.Fd Sci. Technol., 1973, 10 (4), 191.

The cold water soluble extract, in conjunction with volatile oil and non-volatile ether extract will check any admixture with exhausted or inferior stuff.

KAR

8.7 Characterisation of waste effluents from a commercial Pimiento canning operation, W.A.BOUGH, J.Milk & Fd Technol., 1973, 36 (7), 371.

The first stage of processing where the roasted peel was removed by washing, accounted for the most concentrated effluent. Another concentrated effluent resulted from the citric acid dip just before the packing and closing area. Two effluents from the grading area were also obtained. The total wastes produced from pimiento canning contained 3.2, 60.2, and 35.4 lb of suspended solids, COD (Chemical oxygen demand) and BOD per ton of raw pimientos.

JVS

9. MEAT, POULTRY AND FISH

9.16 Critical evaluation of AOAC method of analysis for nitrite in meat, ROSEMARY A. NICHOLAS and JAY B. FOX Jr. J.Ass. off. anal. Chem., 1973, 56 (4), 922.

The AOAC method consists in the dilution of 5 g. of comminuted meat to 300 ml, steam heating of diluted sample for 2 hours, and addition of 5 ml. saturated $HgCl_2$, cooling, making up to 500 ml and filtration. An aliquot of the filtrate is treated with 2 ml. of Griess reagent (sulfanilic acid and alpha naphthylamine), diluted to 50 ml. and color allowed to develop for 1 hour for reading the absorption in a spectrophotometer at 520 nm. Suggestions made for improvement of method are: omission of mercuric chloride treatment; recrystallisation alpha naphthylamine before use; color development for 25 min; and use of higher concentration of Griess reagent.

JVS

9.17 Meat quality and the acceleration of postmortem glycolysis by electrical stimulation, W.A. CARSE, J.Fd Technol., 1973, 8 (1), 163.

A brief period of electrical stimulation of freshly slaughtered lamb carcasses by 250 V pulses is shown to increase subsequent rates of post-mortem glycolysis and hasten rigor onset. Stimulated carcasses put into a blast freezer at 5 hr post-mortem were as tender as untreated carcasses held for 16 hr before freezing to avoid toughness caused by post-morteum shortening.

AA

*+ 9.18= Quality of AFD meat during storage, T.N. KAUL, J.B. ROY, B.S. CHAUDHARY, R.N. SHARMA and T.R. SHARMA, J. Fd Sci. Technol., 1973, 10 (4), 153.

During 2 years of storage period of AFD mutton, large proportion of the sample showed total counts of less than 400/g. No pathogens and coliforms were detected. Slight decrease in reconstitution was noticed on storage, but no off-flavour or rancidity.

AA

9.19 Meat emulsions, WILLIAM L. SULZBACHER, J.Sci. Fd Agric., 1973, 24 (5), 539.

Review covers some of the more important principles including the role of proteins and fat in these emulsions and to touch their practical application to sausage making practises. 19 references.

KAR

9.20 Evaluation of some non-meat proteins for use in sausage, M.A.THOMAS, P.A.BAUMGARTNER, F.W.BOARD and P.G.GIPPS, J.Fd Technol., 1973, 8 (2), 175.

Fresh sausages were made having 0,20,40, or 60% of the meat protein replaced with milk co-precipitates soy protein preparations or sodium caseinate. Two milk co-precipitates at 40% substitution gave sausages comparable to control in acceptibility; other protein preparations gave sausages of poorer sensory quality. No relation was found between the physical properties of the emulsions and the sensory properties of the sausages.

AA

9.21 Studies on bacterial load of raw meat, V.N.BACHHIL and S.S.AHLUWALIA, J.Fd Sci. Technol., 1973, 10 (3), 128.

Meat samples (75 No) collected from three abattoirs (Pantnagar, Haldwani and Bareilly) showed a total viable count (TVC) of 35×10^7/g in liver and the maximal average recorded was 10^8/g.

KAR

9.22 Red meat and poultry inspection; Microbiology of equipment and processing, R.PAUL ELLIOTT, J.Milk & Fd Technol., 1973, 36 (6), 337.

Details of Federal Meat Inspection Act and Poultry Products Inspection act of U.S.A.

9.23 Experimental survival studies of Sporothrix schenckii in a meat product, J.H.SCHARDING, D.C.KELLEY, J.E.COCK & D.H.KROPP, J.Milk & Fd Technol., 1973, 36 (6), 311.

Studies carried out with a Frankfurter test model designed to simulate the length, diameter and cooking characteristics of a commercial Frankfurter have shown that S.schlenkii can survive the processing procedures followed by manufacturers. In these procedures, the final internal temperatures of Frankfurters would be about 71°C, and the processing time about 43 minute

JVS

9.24. Bacteriological quality of raw refrigerated ground beef, C.L.DUITSCHAEVER, D.R.ARNOTT and D.H.BULLOCK, J.Milk & Fd Technol., 1973, 36 (7), 375.

Sixty four per cent of refrigerated (213 samples) ground beef examined from different retail stores shows mesophilic and psychrophilic counts in excess 10 million per gram. All samples showed Staphylococci

9.25 and 93% of these contained more than 1000 organisms per grain. Coagulase positive staphylococci were present in 17% of the samples. The enterococcus counts ranged from less than 10 to 10,000 per gram. Coliform counts in 95% of the samples exceeded 100 per gram. Salmonellae were not isolated.

JVS

+9.25 Microbial flora of gamma-irradiated vacuum-packed ground beef stored at different temperatures, NADUKA OKAFOR, J.Fd Sci. Technol., 1973, 40 (3), 95.

Vacuum-packed ground beef was stored unirradiated as well as after irradiation at doses of 0.1, 0.3 and 1.0 Mrads at 1,5, 15,25 and 30°C. Pseudomonas and Microba-cterium did not survive at lower irradiation doses. Organisms developing on media designed for Lactobacilli, yeasts, Streptococci, Coliforms and Micrococci survived the 0.3 Mrad dose at varying degrees. Lactoba-cilli and yeasts predominated among the organisms surviving the 1.0 Mrad dose.

AA

9.26 Nitrosopyrrolidine in cooked bacon, T.FAZIO, R.H.WHITE? L.R. USOLD and J.W.HOWARD, J.Ass. ff. anal. Chem., 1973, 56 (4), 919.

N-nitrosopyrrolidine has been found at 10-108 mcg/kg levels in 3 commercial brands of cooked meat.

JVS

9.27 Concentration of egg white by ultra filtration, R.E. PAYNE and C.G.HILL Jr. & C.H.AMUNDSON, J.Milk & Fd Technol., 1973, 36 (7), 359.

The egg white was concentrated to a total solid content of 41% by ultra filtration. Electrophoretic studies did not indicate any physical injury to egg white proteins. This technique of concentration is an improvement over conventional process which tend to degrade the whipping characteristics of egg white proteins by heat or physical denaturation of proteins.

JVS

9.28 Effect of egg shell sweating on microbial spoilage of chicken eggs, D.V.VADHERA & R.C.BAKER, J.Milk & Fd Technol., 1973, 36 (6), 321.

Sweating of eggs had little effect on the spoilage of egg. Defective washing patterns induced spoilage and the degree of spoilage by Pseudomonas was greater

*+9.29 An improved method for determining solubility of egg powder, M.P.SRIVASTAVA and B.S.BHATIA, J.Fd Sci. Technol., 1973, 10 (4), 189.

The ISI method for estimation of solubility using water for extraction did not give consistent results. An improved method using solvent mixture, salt solution and water, was found to give consistent and comparable results.

AA

**+9.30 Packaging studies on spray dried whole egg powder in pouches of flexible films and laminates, S.S.LANGAR, B.ANANDASWAMY and N.BALASUBRAMANYAM, J.Fd Sci.Technol., 1973, 10 (3), 101.

A moisture content of 6 per cent in the egg powder is critical. Temperature has pronounced effect on the solubility of the product with higher moisture content. Consumer size pouches made of a laminate of paper/aluminium foil oil 0.009 mm/150 gauge polyethylene and 300 gauge high density polyethylene would provide a shelf life of about 6 months and 3 months respectively under normal storage conditions.

AA

*+9.31 Studies on the keeping quality of whole egg powder light-weight flexible packaging, M.P.SRIVASTAVA, N.NIRMALA and B.S.BHATIA, J.Fd Sci Technol., 1973, 10 (3), 112.

Foam-mat fried egg powder compressed into black and wrapped in cellophane before finally packing and sealing in paper foil poly laminate has been found to remain acceptable for one year when stored at 37°C. Accelerated freeze dried egg powder in the same type of packing keeps well for one year at ambient room temperature (20-30°C) and eight months at 37°C. Spray dried egg powder in the same packing remains acceptable for four months when stored at 37°C.

AA

9.32 Measurement of egg content of noodles by multiple radial immuno diffusion (MRI) analysis of egg proteins with albumen - specific antiserum, P.CANTARELLI & CLAUDIA TASSI-MICCO, J.Ass. off. anal. Chem., 1973, 56 (4), 926.

Extracts of egg noodles are prepared in 0.15 M NaCl and analysed by MRI using a commercially available albumen antiserum. Measurement of the area of the precipitation ring allows the quantitative evaluation of the egg content of noodles. Electrophoresis in polyacrylamide gel is used to identify the albumen proteins.

AA

*9.33 Differences in sarcoplasmic and fibrillar proteins of Bombay duck (Harpodon nehereus) to heat and radiation induced denaturation, S.B.K.NARR IER, V.NINJOOR, P.L. SAWANT and U.S.KUMTA, J.Fd Technol., 1973, 3 (3), 233.

A radiation dose of 0.25 Mrad combined with heat treatment (60°C for 10 min) resulted in 83% precipitability of the fibrillar protein fraction (extracted in 0.01 M phosphate buffer containing 5% sodium chloride) without causing the precipitation of the sarcoplasmic proteins. Sarcoplasmic proteins denaturated by irradiation or heat treatment exhibited increased rate of tryptic hydrolysis and alterations in the pattern of Sephadex gel filtration and polyacrylamide gel electrophoresis. Susceptibility of the fibrillar proteins to trypsin was not changed.

AA

*+9.34 Factors influencing yellow discolouration of white Pomfret (Stromateus cinereus), S.K.AGARWAL and U.S.KUMTA, J.Fd Sci. Technol., 1973, 10 (2), 68.

A method based on the complete extractability of pigment in 10 per cent NaOH was developed for assessing discolouration of white pamfret. This was computed by $\frac{T_1-T_2}{T_3} \times 100$ where Ta, T2 and T3 are per cent transmittance of the extracted pigment of 420, 400 and 350 mμ. Browning potential of alcohol soluble compounds was about 4 times more than that of total lipids but this decreased nearly to half i.e., 2 times in presence of externally added sugars (ribose or glucose). Dipping the fish in water as well as cooking treatments, suppressed the discolouration. However this could be completely inhibited by vacuum packaging as well as by hydroxylamine.

AA

9.35 The hydrolysis of sodium triphosphate in cod and beef muscle, A.H.SUTTON, J.Fd Technol., 1973, 3 (2), 135.

The hydrolysis of triphosphate and polyphosphate follow the typical 'consecutive' reaction of the type'.

$(P_3O_{10})^{5-} \xrightarrow{K_1} (P_2O_7)^{4-} \xrightarrow{K_2} (PO_4)^{3-}$

For cod, $K_1 > K_2$ and only orthophosphate remains after 30-40 hr at 0°C. In beef $K_2 > K_1$, and also K_2 (beef) > K_2(Cod). This results in higher levels of pyrophosphate being formed in beef muscle from the triphosphate and the hydrolysis takes place over a much longer time period than Cod.

KAR

9.36 Polyphosphates and fish: some chemical studies, D.M.GIBSON and C.K.MURRAY, J.Fd Technol., 1973, 8(2),197.

The natural phosphorous content of fish is so large that it was found very difficult to determine whether a particular fish has been treated with polyphosphate or not. The amount taken up by fish under the experiment was equivalent to 50-100 mg P/100 g fish muscle.

AA

9.37 A rapid dielectric measurement of fat in fish and fish products, R.M.STOREY and M.L.WINDSOR, J.Fd Technol., 1973, 8(3), 259.

The construction of a test cell suitable for measuring the oil content is outlined; the instrument was designed to be robust, direct reading and simple to operate, agreement with soxhlet within 1% fat was obtained.

KAR

9.38 Versatile combustion - amalgamation technique for the photometric determination of mercury in fish and environmental samples, W.A.WILLFORD, R.R.HESSELBERG & H.L.BERGMAN, J.Ass. off. anal. Chem., 1973, 56 (4),1008.

Upto 2.0 g. fish tissue is heated in a stream of O_2 (1.2 litres/min) for 3.5 min. in 1 tube of a 2-tube induction furnace. The released Hg vapor and combustion products are carried by the stream of O_2 through a series of traps (6% NaOH scrubber, water condenser, and $Mg(ClO_4)_2$ drying tube) and the mercury is collected in a 10 mm diameter column of 24 gauge gold wire (8g.) cut into 3 mm lengths. The resulting amalgam is heated in a second tube of induction furnace and volatilised mercury is measured with a mercury vapor meter. equipped with a recorder integrator. Total analysis time is approx. 8 min./sample. The detection limit is less than 0.002 mcg.

AA

9.39 Drained weight determination of frozen, glazed snow crab meat, G.A.MILLER, J.Ass. off. anal. Chem., 1973, 56 (4),386.

Collaborative study of methods 18.006-18.007 and 18.008-18.009 (JAOAC, 1971, 54, 459).

9140 Effects of cooking and rinsing on the protein losses from blue crabs, L.M.HANOVER, N.B.WEBB, A.J.HOWELL and F.B.THOMAS, J.Milk & Fd Technol., 1973, 36 (8), 409.

Cooking of blue crab at 121°C resulted in greater cook loss as compared to cooking at 100°C. Analysis of supernatants obtained after centrifugation of cooked samples showed that the loss of proteins was greater at 121°C than at 100°C. The protein loss in solid part was however, greater at 100°C than at 121°C cooking. Rinsing of cooked samples or washing them in brine showed that the protein losses were greater at 100°C than at 121°C cooking.

JVS

See also

Determination of total arsenic in animal tissues, 13.8.
Enterovirus in sausage and ground beef, 15.35.
GC determination of diethylstilbesterol (DES) and its glucuronide in cattle tissues, 13.10.
Palatability of sponge cakes prepared with egg yolks, 7.4.
Polychlorinated biphenyls in chicken fat and polychlorinated biphenyl - DDT combinations in fish, 16.7.
Vibrio parahaemolyticus in sea foods, 15.33.

10. MILK AND DAIRY PRODUCTS

10.7 Utilisation of dairy ingredients in foods, J.J.JONAS, J.Milk & Fd Technol., 1973, 36 (6), 323.

Discusses the rationale of using dairy proteins, and sugars in different food systems. 73 references.

10.8 Pasteurisation of grade A milk and milk products by steam injection, R.W.DICKERSON, W.H.STROUP, H.B.THOMPSON, Jr. & R.B.READ Jr. J.Milk & Fd Technol., 1973, 36 (8), 417.

Steam injectors may be used to pasteurise milk products when the steam and the product flow are isolated from the pressure fluctuations in the injection chamber, when no vapor is formed in the holding tube and when non-condensable gases are eliminated from the steam supply. The injection chamber is isolated by installing supplementary orifices of a proper size at the injector ports to maintain a product pressure drop of 10 psi across the injector. Vapor formation is prevented by maintaining a holding tube pressure 10 psi above the boiling pressure of the liquid product. Non condensable gases are eliminated from the steam supply by installing an approved deaerator in the boiling system.

AA

10.9 Collaborative study of an automated optical somatic cell counting (OSCC) methodqfor raw milk, W.N.KELLEY, J.Ass. off. anal. Chem., 1973, 56(4), 951.

The study has indicated that the standard deviation for the direct microscopic cell counting (DMCC) was 0.1086 and for the OSCC method 0.0911 (at a sampling rate of 30/hr). Hence OSCC method appears to be more precise than DMCC method.

10.10 Electron microscopic observations on the casein micelles of buffalo milk = A preliminary study. SKARIAH OOMMEN and N.C.GANGULI, J.Fd Sci. Technol., 1973, 10 (4), 167.

Buffalo and cow casein micelles were seen as aggregates of spheroidal granules and the aggregation was more in buffalo micelles. The diameter of the particles were in the range of 80 to 250 nm and 50-200 nm for buffalo and cow casein micelles respectively. On treatment with urea, aggregation of particles was noted and in higher urea concentration the micelles look partially dissolved. There was slight deformation in shape in the 2-mercapto ethanol treated samples. In rennet treatment samples, the micelle aggregates dissolved partially indicating partial proteolysis of the protein.

AA

10.11 Determination of lactose in milk by GLC. H.Q.JAYNESS and T.ASAI, J.Milk & Fd Technol., 1973, 36 (6), 333.

Lactose in milk was estimated by the GLC of trimethylsilyl esters. The quantitativedetermination was accomplished by using sorbitol as the internal standard.

JVS

*+10.12 Effect of homogenization and pasteurization on Gerber fat test of buffalo milk, C.PRASAD and C.A. MULAY, J.Fd Sci. Technol., 1973, 10 (4), 188.

Pasteurization has insignificant influence on Gerber fat test. Although the sequence of homogenization was not significant, enough in lowering fat test, homogenization prior to pasteurization showed overall lower fat values compared to those of samples homogenized after pasteurization over raw milk fat test on percentage basis.

KAR

*+10.13 Comparative assessment of quality khoa and their products from homogenised and unhomogenised milk, C.A.MULAY and B.G.LADKANI, J.Fd Sci. Technol., 1973, 10 (3), 110.

Khoa made from homogenised milk, both cow and buffalo, was softer and light brown in colour as compared to those prepared from unhomogenised milk. Homogenised cow and buffalo milk khoa could not be patted together unlike the unhomogenised milk khoa. Fat leakage was higher in unhomogenised cow and buffalo milk as compared to corresponding lots of unhomogenised milk koha. Peras prepared from homogenized cow milk and buffalo milk were distinctly softer but more sticky

than those prepared from corresponding lots of unhomogenised milk khoa.

10.14 Effect of fluorescent light on the flavor and selected nutrients of homogenised milk held in conventional containers, P.S.DINICK, J.Milk & Fd Technol., 1973, 36 (7), 383.

Studies were carried out on the effects of exposing homogenised milk packaged in containers made from unprinted fibre board, blown mold plastic and clear plint glass, to flourescent light. The off flavour developed in milk stored in plastic and glass containers after 12 hours; in fibre board containers flavor was protected upto 48 hours. Riboflavin destruction in different containers was small but varied to some extent. Ascorbic acid losses were evident in all milk samples independent of containers. Amino acid composition of milk tested for light effect in different containers was not different from control.

JVS

10.15 Confusion about yogurt - compositional and otherwise, M.KROGER & J.C.WEAVER, J.Milk & Fd Technol., 1973, 36(7), 338.

The average composition of Yogurt samples from Central Pennsyllvania was as follows: fat, 1.18; protein, 4.29 and total solids, 24.97 per cent. The caloric content was 103.2 per gram.

JVS

*+10.16 Comparative studies on microbial milk clotting enzyme, T.S.KRISHNAMURTHY, S.S.S.NAMBUDRI and R.A.SRINIVASAN. J.Fd Sci. Technol., 1973,10(3), 118.

Six microbial milk clotting enzymes obtained from B.subtilis K-26, B.cereus BC-1 and FR-36, B megaterium K40, Streptococcus liquefaciens S-103 and Aspergillus nidulans LC-1 were compared with Hansen's rennet. The microbial enzymes were stable when dissolved in 30 mg per cent Ca Cl_2 but showed loss in activity when dissolved in $CaCl_2$ (15-20 per cent) or distilled water or NaCl (2.5-5.0 per cent) solution. Enzymes of B. subtilis K-26 and A. nidulans LC-1 formed firm coagulums. Microbial enzymes required the addition of 3 per cent starter and ripening period of 30 min for showing accelerated activity.

K.R

**+10.17 Changes in the carbonyl composition of a milk based sweetmeat - burfi during preparation and storage, J.Hemavathy and J.V.Prabhakar, J.Fd Sci. Technol., 1973, 10 (4), 156.

There was two fold increase in carbonyls during the open pan conversion of milk (khoa) to burfi. The major compounds identified are methyl ketones and saturated aldehydes; there was no quantitative difference in the count of methyl ketones between Khoa and burfi; khoa was rich in lower carbon chain length methyl ketones while burfi was rich in higher methyl ketones.Similar differences were also noticed in the content of saturated aldehyded. During storage of burfi there was quantitative decrease in methyl ketones and increase in the saturated aldehydes.

AA

*+10.18 A note on the factors affecting the yield and quality of Chhana, G.L.JAGTAP and P.C.SHUKLA, J.Fd Sci. Technol., 1973, 10 (2), 73.

Boiling of homogenized milk with 4.9 per cent fat provides highest yield and percentage recovery of total solids, fat and protein without affecting quality of Channa.

KAR

10.19 Fate of Bacillus cereus in cultured and direct acidified skim milk and cheddar cheese, E.M.MIKOLAJCIK, J.W.KEARNEY and T.KRISHTOFFERSON, J.Milk & Fd Technol., 1974, 36 (6), 317.

With increased acidity in milk, vegetative cells of B.cereus did not survive but spore counts remained unaffected. In direct acidified skim milk the spore germination, and outgrowth, and cell multiplication decreased with lowering of pH from 6.0 to 5.0. During the production of cheddar cheese rapid multiplication of B.cereus during the stage which corresponded to the end of cooking to milling of the curd. The spores of this organism survived for 54 weeks of curing.

JVS

See also

Nisin for cheese and khoa, 12.19
Protein enriched milk biscuits, 2.42.
Quality of soft serve ice cream, 7.5.

11. COFFEE, TEA AND COCOA

11.8 Quality assurance in a franchised food industry, A.BOLAFFI, E.A.TILLINGHAST Jr., K.J.HOYT & VICTORIA D.MALLARY, Fd Technol.Champaign, 1973, 27 (8), 24.

The effectiveness of a systematic approach for assuring the quality of coffee in a franchised food service has been demonstrated and discussed. This system should be useful in assuring the quality of other food items such as doughnut mixes, frying shortenings and doughnut fillings.

JVS

11.9 Technical note: Studies on instant tea. I. A comparison of the composition of instant teas with their original teas, R.L.CHANG, H.Y.HSU AND C.F.LI, J.Fd Technol., 1973, 8 (2), 217.

Instant teas were manufactured from different grades of both green and black teas and their chemical compositions were compared. Instant teas obtained from higher grade teas are of better quality with respect to colour, taste and flavour. The flavonol content of instant tea was higher than the original tea. Higher grade tea and instant tea contain less total ash and more water soluble ash than lower grade tea. The content of nitrogenous substances is also given.

KAR

11.10 Studies on instant tea. II. An improved spray drying with ammonium carbonate as foaming agent, R.L.CHANG and C.F.LI, J.Fd Technol., 1973, 8 (3), 345.

Ammonium carbonate was added as the foaming reagent to the tea extracts. These tea extracts were thus spray dried by the conventional method. The advantages are that a high pressure feeding system is not necessary, and there is no residue left. Also no foam stabilizing agent was needed.

KAR

11.11 GC-MS analysis of flavoury and non-flavoury Ceylon black tea aroma concentrates prepared by 2 different methods, R.L.WICKRAMASINGHE, EMILY L.WICK & TEI YAMANISHI J.Chromatog, 1973, 79 (1), 75.

Aroma concentrates of Ceylon black tea were prepared by steam distillation and adsorption on char coal of the head-space vapor over a tea brew followed by elution with diethyl ether. The former method was superior to the latter, perhaps partly due to formation of artefacts on charcoal. Comparison of GC of aroma concentrates from flavoury and non flavoury tea showed marked qualitative and quantitative variations on the components detected. 21 of these components were identified by MS.

See also

Determination of mycotoxins in cocoa beans, 15.17.

12. FOOD ADDITIVES

12.12 The regulatory status of food color, K.S.KEHR, Cereal Sci. To-day, 1973, 18 (8), 222.

A brief resume of events leading to the 1960 color amendments to the Federal Food, Drug and Cosmetic Act and changes brought about by Amendments. The regulatory activities of FDA since the amendments, its present activities, and future plans in relation to the food colors are discussed.

AA

*+12.13 Anti-testicular effect of metanil yellow in Guinea pig, S.K.KHANNA and G.B.SINGH, J.Fd Sci. Technol., 1973, 10 (2), 75.

Daily ingestion of 3 per cent metanil yellow for 90 days produces degenerative changes in the gametogenic elements of guniea pig testicles. However, low doses (0.1 and 0.5 per cent) were safe till the end of 3 months.

12.14 Long term toxicity study of erythrosine. I. Effects in rats and dogs, W.H.HANSEN, R.E.ZWICKEY, J.R.BROWER and O.G.FITZHUGH, Fd & Cosmet. Toxicol., 1973, 11 (4), 527.

Erythrosine (FD & C Rad No.3) is a coal tar dye used as a coloring in several food products. Feeding of this dye to rats over a 2 year period in diets showed the following effects: growth depression in female rats given 5.0% level; spleen weight decrease in male rats fed at 0.5, 2.0 and 5.0% levels, and in female rats given 5.0% level; and slight coecal distension at and over 1.0% levels. In acute oral toxicity trials, the LD_{50} of erythrosine was found to be 1340 mg per kg. Feeding of female dogs with 0,0.5, 1.0 or 2.0% levels of the dye for 2 years showed no effects which could be ascribed to the consumption of this dye.

JVS

12.15 Long term toxicity studies of erythrosine. II. Effects on haematology and thyroxine and protein-bound iodine in rats, W.H.HANSEN, K.J.DAVIS, S.L.GRAHAM, CARLEENE H. PERRY & K.H.JACOBSON, Fd & Cosmet. Toxicol., 1973, 11 (4), 535.

Feeding of male and female rats with erythrosine either by intubation or in diets for 86 weeks did not show consistent differences in RBC, hematocrit, haemoglobin and reticulocyte counts. Protein-bound iodine in blood which showed increased values were ascribed to the circulating erythrosine in blood serum; the levels became normal 16 weeks after stopping the administration of the compound. The treatment did not show effects on thyroxine-iodine values.

JVS

12.16 Lower sulfonated subsidiary colors in FD&C Blue No.1., Sandra Bell, J.Ass. off. anal. Chem., 1973, 56 (4),947.

Two lower sulfonated subsidiary dyes were prepared by a 2 step - condensation in which 1 mole O-sulfobenzaldehyde was allowed to react with 1 mole of either ethylaniline or ethylbenzylaniline and then with 1 mole of ethylbenzylaniline sulfonic acid. Two subsidiary dyes were separated from commercial samples of FD&C Blue No.1 by column and TLC. The visible and IR spectra of these compounds matched those of the prepared standard lower sulfonated dyes.

AA

12.17 Betalains as possible food colorants of meat substitutes, J.H.VON ELBE & J.Y.MAING, Cereal Sci. To-day, 1973, 18(9), 263.

Red beetroot contains betalains which consist of red-violet betacyanins and yellow betaxanthins; they can be separated by chromatography or paper electrophoresis. Betanin (the major betacyanin in beet roots), has a half life at 25°C of approx. 1,140 ± 100 min at pH 5.) Promising results are reported to have been obtained in the use of beet pigments as colorants in foods.

JVS

12.18 Determination of ether soluble food preservatives after direct extraction on paper, J.RAJAMA & P.MaKELa, J.Chromatog. 1973, 76 (1), 199.

The food preservatives were determined by direct extraction and isolation on chromatographic paper. The recovery of or benzoic acid added at 0.12% level to orange or black currant juice was 95% and 98.4% respectively. The recovery of benzoic acid added homogenates fish at 0.5 and 1% levels was 9216 and 96.1% respectively.

JVS

*+12.19 Use of nisin for extending shelf life of processed cheese and khoa, M.S.SARLA, H.LAKMINARAYANA and A.T. DUDANI, J.Fd Sci. Technol., 1973, 10 (3) 92.

Processed canned cheese with added nisin (100 Ru/g) remained good upto 90 days at 30°C while without nisin it spoiled within 30 days at 30°C. In khoa addition of nisin (100 Ru/g) increased the shelf life more than 1 month at 10°C and by 2 and 3 weeks at 30° and 22°C respectively. Nisin also appeared to prevent the development of yeasts and molds in khoa stored at low temperatures.

AA

12.20 Modification of acute toxicity of mutagenic and carcinogenic chemicals in mouse by prefeeding with antioxidants, R.B.CUMMINGS & MARVA F.WATTON, Fd & Cosmet. Toxicol., 1973, 11 (4), 547.

Feeding of BHT for 4 weeks of male mice protected them against lethal effects of ethylmethane sulphonate (EMS), n-propyl or isopropyl methane sulphonate, EDB, diethyl-nitrosamine, or cyclophosphamide. Male mice were not protected against methyl methane sulphonate (MMS) but female mice were protected against MMS.

JVS

12.21 G.C. of phenolic antioxidants, E.L.STYSKIN & Y.A.GURVICH, J.Chromatog., 1973, 77 (1), 11.

Phenolic antioxidants are used in the production of non toxic polymers for use in food industry. The suitability of various supports and the effect of their treatment on the efficiency and the asymmetry of peaks. For example 3 cresol isomers were separated by using Bentone-245, mixtures of phenol, tert -butylphenols and their tert butyl ethers were also analysed by using Porochrom-1-AW.HMDS.

JVS

12.22 Intestinal effects on Carrageenans in the Rhesus monkey, (Macaca mulatta), K.F.BENITZ, L.GOLDBERG and F.Coulston, Fd & Cosmet.Toxicol., 1973, 11(4), 565.

Native form of carrageenan (HMR) and degraded form (C16) were fed to male/female monkeys in drinking water for 7-14 weeks. A feeding with 1% HMR (1.3g./kg/day) showed gain in weight and good condition in monkeys although ocult blood was seen sporadically in faeces like in cntrols. Only minor changes were found in intestinal tract on autopsy. Monkeys fed with C 16 at 0.5% or 1.0% levels gained weight, but those fed with 2.0% C 16 (intake of approx. 2.9 g./kg/day) showed considerable losses in weight. All monkeys fed food containing C16 lost blood from intestinal tract and also showed same degree of anemia. Several pathological changes were seen in colon.

12.23 Studies on carrageenan and large-bowel ulecration in mammals, P.GRASSO, M.SHARRATT, IMB CARPANINI and S.D. GANGOLLI, Fd & Cosmet. Toxicol., 1973, 11 (4), 555.

Carrageenan in native or degraded form was found to cause the ulceration of large intestines in Guinea pigs and rabbits. Limited observations on humans according to the authors suggest that humans are resistant to this effect.

JVS

12.24 Is Oestrogenic activity present in hops? CATHARINE FINSELAU AND P.TALLALAY, Fd & Cosmet. Toxicol., 1973, 11 (4), 597.

Examination of a number of purified components of hops, including the essential oil fraction and the alpha and beta bitter acids from hop resins from USA and Europe did not indicate oestrogenic activity.

JVS

See also

Effect of additives on degradation of anthocyanins in canned strawberries, 4.36.
Sulphur dioxide and nitrate in detinning grape fruit juice, 4.34.

13. FOOD ANALYSIS

13.7 Collaborative study of a method for the atomic absorption spectrophotometric and polarographic determination of cadmium in food, R.J.GAJAN, J.H. GOULD, J.O.WALTS and J.A.FLORING, J.Ass. anal.Chem., 1973, 56 (4), 876.

Ten commodities, i.e., lettuce, potatoes, orange juice, shredded, wheat, milk, sugar, eggs, fish, frankfurters, rice, beans and oysters were analysed by collaborators. The method consisted in acid digestion, atomic absorption spertrophotometry and polarography.

JVS

13.8 Dry ashing method for the determination of total arsenic in animal tissues: collaborative study, G.H. GEORGE, L.J.FRAHM, & J.P.McDONNELL, J.Ass. off. anal.Chem., 1973, 56 (4), 793.

Tissue samples are dry ashed with MgO and magnesium nitrate and the arsenic is determined colorimetrically with silver diethyl tiocarbonate (sensitivity upto 011 p.p.m level; recovery, 98.8% for poultry tissue and 103.4% for swine tissue).

JVS

13.9 Gas liquid chromatography of food carbonyurates with special reference to trimethylsilyl derivatives. A review. G.G.BIRCH, J.Fd Technol., 1973, 8 (3), 229.

Covers the structure of sugars and their conversion to volatile derivatives, glc of sugar acetates, methyl ethers and TMS ethers, structural functions of glc behaviour, new improvements in glc techniques for sugar analysis and new applications to food carbohydrate research. 77 references.

KAR

13.10 GC determination of diethyl stilbestrol (DES) and its glucuronide (DES-G) in cattle tissues, A.L.DONOHO, W.S. JOHNSON, R.F.SIECK & W.L.SULLIVAN, J.Ass. off. anal. Chem., 1973, 56 (4), 785.

The muscle, liver and kidney tissue are extracted with methanol, and an aliquot corresponding to 50 g. tissue evaporated, and hydrolysed with betaglucuronidase. After hydrolysis overnight, the free DES in the sample is purified by liquid - liquid extraction and is reacted in base with dichloroacetyl to form DES ester. The diester is then subjected to GLC by using a 5% GW-98 column and electron affinity detection. The sensitivity of the procedure was about 0.001 p.p.m.

JVS

See also

Analysis of nitrite in meat, 9.16.
Analysis of aflatoxins, 15.23, 15.19, 15.21, 15.25.
Analysis of Ochratoxin in barley, 15.26, 15.27.
Colorimetric estimation of dichlorvos (DDVP). 16.5
Determination of patulin in apple juice, 15.28.
Determination of Diuron in wheat, 16.12.
Dielectric measurement of fat in fish and fish products, 9.37.
Determination of lactose in milk, 10.11.
Estimation of carbonyls in fruits and vegetables, 16.6.
GC-MS analysis of Ceylon black tea aroma concentrates, 11.11
GC of phenolic antioxidants, 12.21.
GC quantitation of polychlorinated biphenyls in chicken fat, 16.7.
Identification of fungicides using TLC, 16.13.
Photometric determination of mercury in fish and environmental samples, 9.38.
Polychlorinated biphenyls in paper, extraction and estimation, 16.8.

Manometric method for CO_2 determination in wine, 14.28.
Mycotoxin determination, 15.17.
Resistography to classify wheat varieties, 2.36.

14. FOOD MICROBIOLOGY AND FERMENTATION

14.23 Fungi in foods. V. Response of natural populations to incubation temperatures between 12 and 32°C, J.A. KOBURGER, J.Milk & Fd Technol., 1973, 36 (8), 434.

The effect of incubation temperatures from 12 to 33°C on yeast and mold counts was determined using both antibiotic and acidified media to control bacterial growth. Highest counts were obtained on the antibiotic medium. Lowest counts occurred with both media at 32°C. Little difference in recovery was apparent in the range of 12 to 37°C, with the fungi responding in a similar manner in both media to shifts in incubation temperatures.

AA

14.24 A physico-chemical model for the death-rate of a micro-organism, D.S.WARREN, J.Fd Technol., 1973, 8(3), 247.

Application of chemical kinetics, and in particular the theory of absolute reaction rates to thermal death rates of micro-organisms enables the effects of various environmental factors to be predicted and defined. Most compounds having a modifying effect on the influence via alteration of the dielectric constant or ionic strength of the medium. The effect of pH may be described by postulating two differently charged forms of the micro-organism having different death rates. Application of this model to data for Clostridium thermosaccharolyticum and Cl. botulinum reveals that the variation in death rate with pH and temperature, within the pH range 2.5-7, may be described using 5 or 6 parameters only.

AA

14.25 Condition of coliform organisms influencing recovery of sub cultures on selective media, R.B.MAXCY, J.Milk & Fd Technol., 1973, 36 (3), 414.

The effects of stress, of coliform bacterial resulting from exposure to heat, radiation or sodium chloride on behaviour of the progeny have been studied.

AA

14.26 Litmus milk reaction as a distinguishing feature between Streptococcus faecalis of human and non human origins, J.O.MUNDT, J.Milk & Fd Technol., 1973. 36 (7), 364.

It is suggested that for cultures obtained during analytical procedures the reaction in litmus milk and the fermentation of melezitose and melibiose may be employed to distinguish between contamination representing recent pollution of human origin and the presence of S.faecalis as a member of microflora of plants with no sanitary significance.

AA

14.27 Asbestos fibres in beverages, drinking water, and tissues: thin passage, through the intestinal wall, and movement through the body, H.M.CUNNINGHAM & R.D.PONTEFRAT, J.Ass. off. anal. Chem., 1973, 56(4), 976.

Fibres were found in beer, sherry, port, vermonth, soft drinks and drinking water at levels of 1 to 11 million per litre. Crystotile fibres injected into the stomachs of rats were found after 2-4 days in the blood, spleen, liver, kidney, omentum, muscle, lung and brain. Highest levels of orally administered fibres were found in the omentuml Fibres intravenously injected were found in highest quantities in liver and lung.

JVS

14.28 Proposed modification of the monometric method for the determination of carbon dioxide in wine, A.CAPUTI Jr. J.Ass. off. anal. Chem., 1973, 56 (4), 843.

The higher values obtained for CO_2 by the monometric method were traced to the formation of CO_2 from compoments of these particular wines due to the addition of H_2O_2 to oxidise SO_2 believed to be a source of interference. Detection of H_2O_2 from the procedure avoided the problem.

JVS

14.29 Todophors as an aid to sanitation in beer canning plants, PATRICIA J.BRAITHWAITE, J.Fd Technol., 1973, 8 (3), 269.

Unlike the weakly buffered iodophors well buffered formulations showed superior disinfecting ability even in the presence of 3-4% of beer. The biocidal activity was unaffected by pH and only marginally influenced by temperature, whereas sodium hypochlorite controls were sensitive to both. Yeast ascospores were about ten times more resistant than vegetative cells.

KAR

**+14.30 Glutamic acid fermentation employing starchy tubers as raw material, RICHARD JOSEPH and T.N.RAMACHANDRA RAO, J.Fd Sci. Technol., 1973, 10 (4), 160.

Potato, after enzymic hydrolysis and removal of excess biotin by adsorption on activated charcoal enabled accumulation of extra cellular glutamic acid; an yield of 10.75 mg per ml of glutamic acid was obtained after 72 hr in agitated culture (Vol 200 ml) at room temperature (28-30°C).

**+14.31 Valine production by an achromogenic variant of Micrococcus glutamicus, RICHARD JOSEPH, NITIN DESAI, M.S.SHANTHAMA and T.N.RAMACHANDRA RAO, J.Fd Sci. Technol., 1973, 10 (4), 192.

A maximum (2.2 mg/ml yield was obtained with 2.5 per cent glucose in the medium. Ammonium chloride/a maximum yield of 2.9 mg/ml)at 1.5 per cent concentration. The best yield of valine, 4.5 mg per ml was obtained with 0.25 per cent peptone, 0.05 per cent yeast extract and 0.5 per cent meat extract in the medium.

/was found to be the best nitrogen source giving KAR

See also

Aseptic filling in bags, 18.16, 18.18
Aseptic sterilization of pouches, 18.15.
Aseptic packaging in paper board cartons, 18.14.
Bacterial load of raw meat, 9.21.
Bacteriological quality of beef, 9.24.
Beta-amylase activity in germinated bajra and barley varieties, 2.45.
Bacillus cereus in skim milk and Cheddar cheese, 10.19.
Egg shell sweating and microbial spoilage of chicken eggs, 9.28.
Fumigistatic wrappers in food preservation, 18.20.
Microbial flora of gamma-irradiated vacuum packed ground beef, 9.25.
Microbial milk clotting enzyme, 10.16.
Oestrogenic activity in hops, 12.14.
Proteins of barley, 2.46.
Red meat and poultry inspection, 9.22.
Sporothrix schenckii survival in meat product, 9.23.
See under toxicology also.

15. TOXICOLOGY

15.16 Simultaneous detection of metabolites from toxigenic fungi, R.W.PERO and D.HARVAN, J.Chromatog. 1973, 80(2), 225,

By using OV-17 absorbed on Gas Chrom-2 (100-120 mesh) at a level of 3% w/w, the peaks of all fungal metabolites succinic acid, erythritol, penicillic acid, terrein, patulin, kojii acid, mannitol , stearic acid altenuene, alternariol, alternariol monomethyl ether were discernille from mould free corn extract. Such data combined with TLC or GC-MS analysis could be a powerful means of testing food stuffs for the presence of mycotoxins.

JVS

15.17 Modified method for the determination of mycotoxins in Cocoa beans, P.M.SCOTT, J.Ass. off. anal. Chem., 1973, 56 (4), 1023;

Silver nitrate (3%) solution was included in the McOH-water extraction mixture. Recoveries of aflatoxins and ochratoxin-A at 5-45 and 200-300 mcg/kg respectively were satisfactory.

JVS

15.18 Rapid detection of aflatoxin contamination in agricultural products, W.A.PONS Jr., ALVA F.CUCULLU, A.O. FRANZ Jr., LOUISE L.LEE & L.A. GOLDBLATT, J.Ass. off. anal. Chem., 1973, 56(4), 803.

The method consists in the extraction of sample with acetonitrile, removal of impurities by treatment with lead acetate solution, parti-tioning of the aflatoxins in treated extracts into benzene, adsorption of portion of the benzene extract into a column (with zones of acidic alumina and silica gel) and development for 5 min. in chloroform-acetonitrile-2-propanol. Aflatoxin is detected by a sharp blue fluorescent b and above alumina zone when the column is seen under UV light. The method was applied several cereals, oil seeds and nuts. Detection level was as low as 10 mcg aflatoxin/kg.

JVS

15.19 Collaborative study of 3 screening method for aflatoxin in corn, ODETTE L.SHOTWELL & R.D.STUBBLE FIELD, J.Ass. off. anal. Chem., 1973, 56(4), 808.

Extraction of aflatoxin with acetone - water and removal of impurities by ferric gel precipitation was most sensitive and time consuming but could detect 5 ppb aflatoxin. Use of ammonium sulfate as the precipitant after acetone-water extraction reduced the time required for the method and had a sensitivity of 10 ppb. This method also gave best differentiation between levels of aflatoxins.

JVS

15.20 Incidence of aflatoxin in Southern corn-1969-70, C.L. SHOTWELL, C.W.HESSELTINE & M.L.GOULDEN, Cereal Sci. To-day, 1973, 18(7), 192.

Southern-grown commercial corn samples taken in this study found only 4% of yearly production in U.S.A. The sixty samples included were consisted of both yellow and white corn. Four of 11 white samples contained6 to 141 ppb of aflatoxin B-1. The positive samples were in 2.5 grades B 4 and 5, with the highest levels in grade 5. Seventeen of 49 yellow corn samples analysed contained 4 to 308 ppb of aflatoxin B-1. The poorest grades of samples had the highest levels of aflatoxin B-1.

JVS

15.21 Modified rapid screening method for aflatoxin in corn, GAIL M.SHANNON, R.D.STUBBLEFIELD & ODETTE L.SHOTWELL, J.Ass. off. anal. Chem. 1973, 56 (4), 1024.

Use of acetone-water (85+15) and a saturated ammonium sulphate for extracting aflatoxin showed lesser interferences and also more compact fluorescent zones on the developed mini columns. This method could be used for samples of corn 10 ppb or more of aflatoxin.

JVS

15.22 Aflatoxin produced by A.parasiticus when incubated in the presence of different gases, C.H.SMITH & E.H.MARTH, J.Milk & Fd Technol., 1973, 36 (8), 421.

Aflatoxin formation by A.parasiticus in a chemically defined medium was maximal under fermentation conditions lacking agitation or sparging of air. Increasing the rate of aeration reduced toxin production although the glucose utilization increased. The formation of toxin was suppressed by the introduction of high levels of CO_2 or O_2 into the invironment.

JVS

15.23 Application of high-speed liquid chromatography (HSLC) to the analysis of aflatoxins, J.S.SHANER & D.P.H.HSIEH, J.Ass off. anal. Chem., 1973, 56 (4), 827.

Aflatoxins B_1, B_2, G_1, G_2 and P_1 were partially resolved by HSLC on a forous layer silica adsorbent, using chloroform-isooctane or the eluting solvent and a 254 nm UV monitor for detection. The resolution was a little lesser than that by TLC using adsorbosil-1 and fluorodensitometry for detection. The linearity of HSLC response to B_1 and G_1 extended over the range of 400-3000 ng.

JVS

15.24 Excretion and metabolism of orally administered aflatoxin B_1 by Rhesus monkeys, J.I.DELEZIOS, D.P.H. HSIEH & G.N.WOGAN, Fd & Cosmet. Toxicol., 1973, 11 (4), 605.

In the present study oral feeding of aflatoxin B_1 absorbed on casein to male Rhesus monkeys showed aflatoxin M_1 as the major metabolite in urine. A male monkey of 3 kg. body weight, fed 45 mcg aflatoxin B_1 excreted about 8 mcg of aflatoxin during the first 24 hours.

JVS

15.25 Collaborative study of the chicken embryo bioassay for aflatoxin B_1, JACQUELINE VERRETT, J.WIMBUSH, [illegible] and W.F.SCOTT, J.Ass. off. anal.Chem., 1973, 56 (4), 901.

Based on collaborative study the method has been adopted as official first action.

15.26 Analysis of Ochratoxins A and B and their esters in barley, using partition and TLC.I. Development of the method, S.NESHEIM, N.F.HARDIN, OCTAVE J.FRANCIS Jr., and W.S.LANGHAM, J.Ass. off. anal. Chem., 1973, 56 (4), 817.

The method consists in the extraction of barley with water-chloroform, and the chromatography of extract through a column of aqueous sodium bicarbonate-diatamaceous earth. The ochratoxins esters are removed from the column with hexane-chloroform. By eluting the column with chloroform-formic acid ochratoxins A and B are obtained. The ochratoxin esters are purified again on an aqueous sodium bicarbonate-methanol-diatamaceous earth column. The extracts are then subjected to TLC and the fluorescence intensity of the spots measured. The presence of ochratoxins A and B is confirmed by the formation of ethyl ester derivatives (recovery, 81.2%; lower detection limit, 12 mcg/kg).

JVS

15.27 Analysis of ochratoxins A and B and their esters in barley using partition and TLC. II. collaborative study, S.NESHEIM, J.Ass. off. anal. Chem., 1973, 56 (4), 822.

The method comprises extraction with chloroform - 0.1 M H_3PO_4, extraction of the ochratoxin acids from chloroform on a diatamaceous earth column by salt formation with aqueous sodium bicarbonate, and elution of the free ochratoxins with formic acid in chloroform. The ochratoxin esters which remain in the chloroform after the removal of the ochratoxin acids are separated from fat on a diatamaceous earth column by partition from hexane with aqueous methanol saturated with sodium bicarbonate and are subsequently eluted

with formic-acid-hexane-benzene. Final quantitation for both ochratoxin acids and esters is accomplished by estimation of fluorescent intensity on TLC either visually or densitometrically. The chemical confirmatory tests for ochratoxins A and B involves preparation of the corresponding ethyl esters with boron trifluoride-ethanol and comparison of the Rf values of these derivatives with those of authentic Ochratoxin ethyl esters prepared from standard Ochratoxins A and B;

AA

15.28 Improved method for TLC determination of patulin in apple juice, P.M.SCOTT & B.P.KENNEDY, J.Ass. off. anal. Chem., 1973, 56 (5), 813.

The apple juice is extracted with ethyl acetate, and the extract is dried, concentrated, diluted with benzene and passed through silica gel column. The patulin is eluted with benzene-ethyl acetate and detected by TLC using a spray of 3-methyl-2-benzothiazolinene hydrazone, hydroquinone. Recoveries of patulin added to fresh apple juice were at levels of 25-400 mcg/litre ranged from 75-95%.

JVS

15.29 Inhibition of alcohol and lactic dehydrogenases by patulin and penicillic acid in vivo, S.H.ASHOOR & F.S.CHU, Fd & Cosmet. Toxicol., 1973, 11 (4), 617.

Both the mycotoxins were non competitive inhibitors of alcohol dehydrogenase (ADH) but were competitive with regard to rabbit muscle lactic dehydrogenase (LDH). Cysteine reversed the inhibitory effect of both mycotoxins on LDH but not on ADH.

AA

15.30 Incidence of Salmonellae in commercially prepared sandwiches for the vending trade, N.A.KHAN & T.A.McCASKEY, J.Milk & Fd Technol., 1973, 36 (6), 315.

Analysis of a total of 646 samples consisting of 13 types of sandwiches obtained from 5 vending firms did not show the presence of Salmonellae.

JVS

15.31 Studies of the recovery of frozen Salmonella gallinarum: the roles of cooling rate, initial cell concentration and plating medium, P.M.McCACH and B.JUVEN, J.Fd Technol., 1973, 8 (2), 211.

Freezing (-40°C) a cell suspension of Salmonella gallinarum at a cooling rate of 18°C per min. and an initial cell concentration of 37×10^7 cells/ml resulted in a recovery more than five times that obtained from a lower cooling rate (0.5°C per min). The apparent recovery on a selective medium immediately after freezing, was only 60% of that on a non selective medium, and decreased to 5% after 1 week of storage at -20°C.

KAR

15.32 Modifications of the technique for differentiating cultures isolated by the official AOAC Salmonella method, P.L.POELMA & AIDA ROMERO, J.Ass. off. anal. Chem., 1973, 56 (4), 1027.

15.33 What sea food processors should know about Vibrio parahaemolyticus, J.S.LEE, J.Milk & Fd Technol., 1973, 36 (8), 405.

The growth potential and requirement of sodium chloride are discussed in detail. Effects of pH, temperature and antimicrobial agents have also been presented. 36 references.

JVS

15.34 Viruses in foods, N.N.POTTER, J.Milk & Fd Technol., 1973, 36 (6), 307.

Review. Discusses problems inherent in studies of viruses in foods. 30 references.

15.35 Enterovirus persistance in sausage and ground beef, J.E.HERRMANN & D.O.CLIVER, J.Milk & Fd Technol., 1973, 36 (8), 426.

The persistance of Coxsackie virus type 49 in experimentally contaminated ground meat was not significantly affected by bacterial growth during storage at 23° or 4°C for 8 days. After 2 weeks of storage at both temperatures more than 90 per cent of the input virus was no longer infective. In the preparation of sausage, CA9 withstood both bacterial fermentation process and subsequent heat treatment. From these studies, it appears that enteroviruses are quite stable in ground meat products.

JVS

15.36 The effects of long-term ingestion of methiomazole on the thyriods of rats, N.V.OWEN, R.M.WORTH & G.F. KIPLINGER, Fd & Cosmet. Toxicol., 1973, 11(4), 649.

Methimazole is an antithyroid drug in human medicine and its inclusion in the feed of meat-producing animals improves carcass quality. A feeding study carried out for 2 years on rats showed that 5 ppm was the no-effect dietary level of methimazole on the thyroids of rats.

JVS

15.37 Toxic heavy metals in vegetables and forage grasses in Missoure's lead belt, D.D.HEMPHILL, C.A.MARIENFELD, R.S.REDDY, W.D.HEIDLAGE and J.O.PIERCE, J.Ass. off.anal. Chem., 1973, 56 (4), 994.

Analysis carried out in lead mining and smelting areas showed the following maximum levels of Pb and Cd (mcg/g dry wt) respectively letuce leaf, 1324, 34.5 radish root, 518, 13.7; and green bean pods, 136, 8.5. vegetables in control countries contained far lesser levels of Pb and Cd.

JVS

15.38 Detergents, phosphates and environmental control, R.B.BARRETT, T.E.BRUNELLE & W.M.PODAS, J.Milk & Fd Technol., 1973, 36 (7), 368.

Entrophication can be considered as the increase in biological productivity in a body of water supported by fertiliser inputs which stimulate the growth of aquatic flora. Accelerated eutrophication is caused by sewage, industrial effluents, and agricultural wastes. The role of phosphorus in accelerated or cultural eutrophication has been discussed.

JVS

See also

Anti-testicular effect of metanil yellow in guinea pig, 12.13.
Antioxidants and toxicity, 12.20.
Intestinal effects of carrageenans in Rhesus monkey, 12.22, 12.23.
Oestrogenic activity in hops, 12.24.
Toxicity studies on erythrosine, 12.14, 12.15.

16. INFESTATION, PESTICIDES & FUNGICIDES

*+16.5 Colorimetric estimation of dichlorvos (DDVP), G.MUKHERJEE T.S.B.NERJEE, A.K.MUKHERJEE and T.V.MATHEW, J.Fd Sci. Technol., 1973, 10(3),126.

A rapid and accurate method for the quantitative estimation of 0,0-dimethyl 2,2- dichlorovinyl phosphate (DDVP) in formulations by hydrolysing with alkali is described. The colour produced by the residual alkali with carbon disulphide and ethyl alcohol is measured quantitatively in a colorimeter.

AA

*16.6 A single step extraction and clean up method for estimation of carbaryl in fruits and vegetables, S.N.DESHMUKH and JAI SINGH, J.Fd Sci. Technol., 1973, 10(3), 126.

Carbaryl is extracted from the substrate with methylene, chloride and the extract is passed through 'Florisil' column activated at 130°C for 24 hr. Insecticide is hydrolysed by methanolic alkali and the intensity of colour developed by adding p-nitrobenzene diazonium fluoborate is measured at 470 m/u.

AA

16.7 Collaborative study of the recovery GC quantitation of polychlorinated biphenyls in chicken fat and polychlorinated biphenyl-DDT combinations in fish, L.D. SAWYER, J.Ass. off. anal. Chem., 1973, 56 (4), 1015.

The results of study with chicken fat and fish have shown the adequacy of AOAC multipesticide residue methodology for the recovery of PCB in fatty food sample types.

JVS

16.8 Extraction and clean-up for determination of polychlorinated biphenyls (PCB) in paper and paper board, SUSAN J.V.YOUNG, C.EINS FINSTERWALDER & J.A.BURKE, J.Ass. off. anal. Chem., 1973, 56 (4), 957.

The PCB have been found in paper food packaging and in some foods packaged in this paper board. PCBs are extracted from the paper samples by reflex with alcoholic KOH. Column chromatography as florisil is used for clean-up. The compounds are determined by GLC with electron capture detection, using conditions previously devised for organochlorine pesticides.

JVS

16.9 Quantitative perchlorination of polychlorinated Biphenyls (PCB) as a method for confirmatory residue measurement and identification, Judith A.ARMOUR, J.Ass. off. anal. Chem., 1973, 56 (4), 937.

Cleaned-up sample extracts containing PCB residues (1-20 mcg) are allowed to react with antimony pentachloride in the presence of chloroform to form decachlorobiphenyl. This procedure converts a multi-component mixture to a single derivative detectable by electron capture GLC, thus providing an easy method for quantifying and identifying PCB residues and at the same time increasing the sensitivity of detection.

AA

16.10 Polychlorinated Biphenyls (PCB) and polychlorinated terphenyls (PCT) in Canadian food packaging materials, D.C.VILLENEUVE, L.M.REYNOLDS, G.H.THOMAS & W.E.J. PHILLIPS, J.Ass. off. anal. Chem., 1973, 56 (4), 999.

A total of 569 food packaging materials were analysed for PCB and total number of components analysed was 911; of these, 81.7% contained less than 1 ppm PCB, 14.9% contained 1-10 ppm PCB, and 3.4% contained more than 10 ppm PCB. In 445 samples analysed for PCT and total number of components analysed was 731; of these 84-5% contained less than 1 ppm, 11.4% contained 1-10 ppm, and 4.1% contained more than 10 ppm. Among 77 foods examined only 2 contained more than 1 ppm of PCB. Also, out of 73 foods tested, none contained more than 0.05 ppm PCT.

JVS

16.11 Infra red studies of chlorinated dibenzo-p-dioxins (DPD) and structurally related compounds, Jo-YUN T.CHEN, J.Ass. off. anal. Chem., 1974, 56 (4), 962.

DPD compounds some of which are highly toxic have been found in food grade fatty acids and in the distillation residues used in animal feeds. IR spectra of 24 chlorinated DPD compounds and structurally related compounds have been presented.

JVS

16.12 Determination of Diuron in wheat, C.PARCUCHAIS, J.Ass. off. anal. Chem., 1973, 56(4), 831.

The wheat sample is extracted with acetone, the extract is dissolved in an acetone-aqueous phase (1+5) and then extracted with petroleum ether and Diuron is extracted into methylene chloride and carbon tetra-chloride. Electron capture GLC is the determinative step with UV spectrophotometry as an alternative technique.

AA

16.13 I. Identification of fungicides by using TLC, P.B.BAKER, J.F.FARROW and R.A.HOODLESS, J.Chromatog. 1973, 81 (1) 175.

A TLC method has been developed for estimating Dodemorph, Tridemorph, Dimethirimol, Ethirimol, Thiabendazole, Benomyl, methyl benzimidazol-2-yl carbamate, carboxin, and oxycarboxin, Silica gel and alumina were the most powerful adsorbants and all fungicides except Dodemorph and Tridemorph could be detected by using solvent systems like diethyl ether-glacial acetic acid-methanol (100:5:2) acetone, light petroleum (60-80°)-acetone (3:1), or diethyl ether-methanol (40:1).

JS

See also

Ethylene oxide gas sterilization of packaging materials, 18.19.
Food protection during distribution, 1.1.
Ionising radiation of rice, 2.32.

17. NUTRITION AND BIOCHEMISTRY.

17.14 Quality assurance system for a fast food service chain, S.KUBU, Fd Technol. Champaign, 1973, 27 (8), 30.

Description of a quality assurance system developed and implemented for Bur-ger King Corporation, Miami. This system enables the monitoring of 1000 restaurants, and inspection of facilities of about 800 suppliers and distributors of food products used in restaurants.

JVS

17.15 Hospital feeding via microwave kitchettes, R.T. KIEPE, C.A.GOLDSMITH, Fd Technol. Champaign, 1973, 27 (8), 16.

Cost analysis of a combined system that would reconstitute precooked frozen foods in the patients' wards by using a microwave oven. Savings in food service administration have been indicated.

JVS

**+17.16 Chemical score of the proteins of rations developed for defence forces, M.V.L.M.A.RAO, M.R.TARA and T.S. SATYANARAYANA RAO, J.Fd Sci. Technol., 1973, 10(3), 39.

The analysis carried out using ion exchange chromatography showed a close agreement in the values of total nitrogen and total essential amino acids as calculated from tables. Three rations were analysed. The determined value for lysine in Ration I was found to be low as compared to the calculated value; the reverse seems to be the case with methionine and tryptophan.

Seealso

Beta-amylase activity in germinated bajra and barley varieties, 2.45.
Biochemical characteristics of Punjab wheat, 2.34.
Characteristics of wheat proteins. 2.34.
Enzymic browning of whole wheat meal flour, 2.39.
GLC of food carbohydrates, 13.9.
Glutamic acid fermentation, 14.30.
Groundnut protein variations, 5.6.
Instant corn, soyflour and milk porridge, acceptability of 19.11.
Nutritive value of Candida utilis supplemented bread; 2.41
Protein enriched milk biscuits, 2.42.
Rapeseed meal and protein concentrate, 5.9.
Sensitivity of Guinea pigs to raw soybeans, 5.3.
Soybean enriched bread, 2.40
Valine production 14.31.

18. FOOD PROCESSING, PACKAGING AND ENGINEERING

18.10 Food extrusion, J.L.ROSSEN & R.C.MILLER, Fd Technol. Champaign, 1973, 27 (8), 46.

The types and applications of extruders in food industry are presented.

JVS

18.11 Concentrations of solutions in vertical gradient freezing, I.SHOMER, SOLANGE FLAVIAN, ZDENKA SAMISH and I.BEN-GERA, J.Fd Technol., 1973, 8(2), 157.

Vertical-gradient freezing applied to sugar solutions and the apple juice resulted in the separation of the ice so that crystallization and separation were achieved in a single step. The influence of the nature of constituents, viscosity and concentration is discussed. The process provides a potentially efficient method of freeze concentration or of removal of solids from solution.

AM

18.12 Technical note: Energy indicator/recorder: a general purpose control box. Use of a single phase wattmeter with a wide range of single and three phase motors, A.T.S.BABB, J.Fd Technol., 1973, 8 (2), 221.

A control box has been devised which will allow a watt or watt-hour meter to be used to measure the work done when a product is mechanically treated during processing. Baking. off controls neutralize the off-load powder of the motor, so that only the power used in the process is measured, and selector switches permit the same meter to be used with both small and large motors operating on single or three phase supplies.

18.13 Magnetic separation of cans: a key to solid waste management, J.R.CHERNOFF, J.Milk & Fd Technol., 1973, 36 (7), 378.

Magnetic separation enables the reclamation of steel cans from collected municipal garbage. Reclaimed steel cans can be used for resmelting into new steel product, in the production of coffee from low grade ores, for detinning and in the production of ferro alloys.

JVS

18.14 Aseptic packaging in paper board cartons, T.I.HEDRICK, Fd Technol. Champaign, 1973, 27 (9),46.

The pure-pak aseptic filler described here for filling food products into paper board/foil/plastic containers is similar to a regular filler, excepting that it provides for better environmental control of container and the filling and sealing areas in the equipment.

JVS

18.15 Aseptic system sterilises pouches with alcohol and UV, L.DOYEN, Fd Technol. Champaign, 1973, 27(9),49.

Description of an aseptic packaging machine which uses alcohol and UV radiation for sterilisation of the machine and flexible packaging film.

18.16 Aseptic filling in flexible bags, P.J.DUFFY, Fd Technol. Champaign, 1973, 27 (9), 52.

The aseptic bag filler manufactured by Gaulin Corp is essentially a pressure/vacuum chamber in which flexible bags are manually filled and sealed.

JVS

18.17 Clean air systems for aseptic packaging, B.AGNEW, Fd Technol. Champaign, 1973, 27 (9), 53.

Laminar air flow system consists in the uni directional flow of clear air through work space. T he function, operation and advantages of laminar air systems with respect to food packaging have been described.

JVS

18.18 FDA's view on chemical sterilisation of aseptic packaging containers; D.A.RIESTER, Fd Technol. Champaign, 1973, 27 (9), 56.

18.19 Ethylene oxide gas sterilisation of packaging materials, D.E.ALGUIRE, Fd Technol. Champaign, 1973, 27 (9), 64.

Ethylene is being used to flexible and semi rigid containers used for packing foods. The 100% ethylene oxide process is a dry, low temperature process which /to can be used/sterilise products without causing damage that would occur by using steam or dry heat The equipment necessary for this treatment has been indicated. The residual, namely ethylene oxide, ethylene glycol and ethylene chlorohydrin dissipate quickly at room temperature and pressure.

JVS

*+18.20 Development and application of fungistatic wrappers in food preservation. Part I. Wrappers obtained by impregnation methods, K.G.GHOSH, A.N.SRIVATSAVA, N.NIRMALA, AND T.R.SHARMA, J.Fd Sci. Technol., 1973, 10 (3), 105.

Sorbic acid treated paper was found to be an effective fungistatic wrapper for bread. It was however necessary to heat the wrapped bread at 95-100°C for a period of ½ to 1 hr. Incorporation of an antioxidant like Embanox-6 in the treated wrapper and also use of anodour adsorbant like coconut charcoal inside the bread packs minimised off flavour development. Sliced bread was found organoleptically acceptable upto 1 month and as sandwich upto 3 months. Sorbic acid treated wrapper could not be used for the preservation of Chapati, parotta and cheese because of the production of bitterness or browning.

See also

Design of commercial reactors for hydrogenating triglyceride oils, 6.9.
Packaging of spray dried egg powder, 9.31, 9.30
Polychlorinated biphenyls in paper and paper board, extraction and clean up, 16.3.
Polychlorinated biphenyls and terphenyls in Canadian food packaging materials, 16.10.

19. FOOD TEXTURE AND FLAVOUR

19.7 Organoleptic assessment of products frozen by two methods: liquid nitrogen and blast freezing, MARGARET A.HILL AND G.GLEW, J.Fd Technol., 1973, 8 (2), 205.

Except macaroni cheese, other products (poached fish, carrots and Coq au vin) did not show much difference in texture and flavour when frozen by either methods and stored for 6 weeks.

KAR

19.8 Factors affecting flavour release and uptake in o/w emulsions. Release and uptake models, P.B.McNULTY and M.KAREL, J.Fd Technol., 1973, 8 (3), 309.

Flavour release in mouth was described by a model which assumes that flavour compounds are transferred from oil to water when the interphase equilibria are disturbed by dilution with saliva and that only the aqueous concentration stimulates perception. The release equations predict high potential extents of flavour release in the mouth at high values of flavour partition coefficients, emulsion dilution, and/or initial emulsion oil fraction. Application of the release model to n -alkanal threshold concentrations in oils and water revealed that n-alkanal partition coefficients and threshold concentrations in o/w emulsions could be satisfactorily predicted.

AA

19.9 Factors affecting flavour release and uptake in o/w emulsions. II. Stirred cell studies, P.B.McNULTYand M. KAREL, J.Fd Technol., 1973, 8 (3), 319.

The study conducted with stirred diffusion cells at 24 ± 1°C indicated that the release rates of n-alcohols (C_3-C_8) from vegetable oil to water increased as chain length increased. The data were correlated satisfactorily with a modification of the Mayers correlation in which transport is controlled by eddy diffusion. The permeability of the stagnant oil interfacial film was estimated from these data; no measurable uptake of cholestrol by vegetable oil was observed over 500 hr. Release rates of C_8 from cilicone oils (linear polydimethylsiloxanes) decrease by less than one order of magnitude when oil viscosity was increased from 48 to 93,000 C P. Release rates of C_6 from hydrogenated vegetable oils decreased by one order of magnitude when the solid fat index was increased from 0 to 66. In all cases the presence of aqueous sodium sulphate or Tween 60 altered the transfer rates only because of the resultant oil-water partition coefficient alteration.

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